federal register

MONDAY, JULY 10, 1978
PART V

WATER RESOURCES COUNCIL

■

LOW BTU COAL GASIFICATION DEMONSTRATION PROJECT, GEORGETOWN, KY.

Water Assessment Report

[8410-01]

WATER RESOURCES COUNCIL

LOW BTU COAL GASIFICATION DEMONSTRATION PROJECT, GEORGETOWN, KY.

Water Assessment

AGENCY: U.S. Water Resources Council.

ACTION: Notice of Water Assessment Report.

SUMMARY: This notice incorporates the Water Assessment Report prepared by the Water Resources Council under the provisions of section 13 of the Federal Nonnuclear Energy Research and Development Act of 1974.

FOR FURTHER INFORMATION CONTACT:

Frank S. Davenport, Staff Specialist, U.S. Water Resources Council, 2120 L Street NW., Washington, D.C. 20037, phone: 202-254-6422.

Dated: June 30, 1978.

LEO M. EISEL,
Director.

WATER ASSESSMENT: LOW BTU COAL GASIFICATION DEMONSTRATION PROJECT, GEORGETOWN, KY.

Prepared by: U.S. Water Resources Council under the provisions of section 13(b) of the Federal Nonnuclear Energy Research and Development Act of 1974.

JUNE 1978.

PREFACE

The U.S. Water Resource Council has prepared this report under the provisions of paragraph (b) of section 13 of the Federal Nonnuclear Energy Research and Development Act of 1974, as amended. The report is the result of a water assessment of water requirements and water supply availability for a proposed low Btu coal gasification demonstration project of the Department of Energy at Georgetown, Ky. Publication of this report in the FEDERAL REGISTER is mandated under the provisions of section 13 to enable public review and comment during a 30-day period. Publication has been scheduled to enable public review concurrently with review of the draft environmental impact statement prepared by the Department of Energy on the project. Comments on the report are to be submitted to: Leo M. Eisel, Director, U.S. Water Resources Council, 2120 L Street NW., Washington, D.C. 20037.

At the conclusion of the 30-day review period, the Council will prepare a response to the comments received and will finalize the assessment report. The final report will then be submitted to the Secretary of the Department of Energy for use in the decisionmaking process for the project.

TABLE OF CONTENTS

Preface
Letter of Transmittal
Summary of Major Findings
Introduction
Conduct of Water Assessment
Project Description
Water Utilization
Status of Planning in Project Area
Water Resources in Project Area
Water Supply Facilities of the Project Area
Wastewater Disposal
Conclusions and Other Findings
List of Selected References

EXECUTIVE SUMMARY OF MAJOR FINDINGS

1. *Water Supply Availability.* Presently available water supplies in the project area are sufficient to meet the water supply requirements of the demonstration project estimated by the Department of Energy, during all periods other than severe droughts. These supplies are available through the water supply systems of either the city of Georgetown or the Kentucky American Water Co. Action is urgently needed by the city of Georgetown to improve the balances of dependable supply and present and future water demands. Action of less urgency is also needed to resolve existing and growing water supply deficiencies in the Kentucky River Basin.

2. *Impacts of Water Supply to the Project.* The impact on sources of water supply caused by withdrawal for supply to the demonstration project by either the city of Georgetown or the Kentucky American Water Co. will be negligible.

3. *Project Wastewater Disposal.* Wastewater originating from the demonstration project can be received by the Georgetown sanitary sewer system following pretreatment at the project site of wastewater emanating from the gasification process, the gas purification system, cooling facilities, and drainage from areas potentially contaminated with coal or process residuals. The pretreatment facilities should be designed, operated and maintained to meet criteria established by the Commonwealth of Kentucky and ordinances for discharge of industrial wastes established by the city of Georgetown. Although surplus capacity is presently available at the Georgetown sewage treatment plant to receive project wastewater, the facilities plan for future management of the Georgetown sanitary system should be updated to reflect potential growth in the quantity of industrial wastewater not presently planned for.

4. *Protection of Royal Spring.* Royal Spring is the present principal source of water supply for the city of Georgetown. Available evidence indicates that some risk exists for wastewater or surface runoff to enter the spring from the demonstration project site. Protection of the water quality of the spring is critical and justifies additional protective measures within the project. These include (1) covering the coal storage area and other facilities where appropriate, and (2) placement of diking to reduce the risk of toxic materials entering the spring as a result of accidental spills, failure of design or construction, or operational error. Requirements of this type should be applied generally to all areas proposed for industrial development within the city of Georgetown which may drain to the spring.

INTRODUCTION

The Water Resources Council was requested by the Department of Energy to perform a water assessment of a proposed project at Georgetown, Ky., for demonstration of the conversion of coal to low Btu gas. The request was made under the provisions of paragraph (b) of section 13 of the Federal Nonnuclear Energy Research and Development Act of 1974, as amended. In the request the Department of Energy indicated the possibility of significant impact by the project on water resources of the area.

The following report contains the findings of the assessment. The report is subject to revision following public review and consideration of public comments.

CONDUCT OF THE ASSESSMENT

The assessment was conducted by staff of the Water Resources Council. Assistance was provided to the Council staff through consulting services by G. Reynolds Watkins Consulting Engineers, Inc., Lexington, Ky. As part of the consulting services, information was acquired and evaluated from the following sources:

PROGRAMS OF WRC MEMBER AGENCIES

Geological Survey, U.S. Department of Interior, Louisville, Ky.
Louisville District, U.S. Army Corps of Engineers, Louisville, Ky.

COMMONWEALTH OF KENTUCKY

Department for Natural Resources and Environmental Protection, Frankfort, Ky.
Center for Energy Research, Lexington, Ky.
Geological Survey, Lexington, Ky.

REGIONAL AGENCIES

Ohio River Basin Commission, Cincinnati, Ohio

LOCAL AGENCIES

Georgetown Municipal Water and Sewer Service, Georgetown, Ky.
City of Georgetown
Scott County—Georgetown Planning Commission, Georgetown, Ky.
Bluegrass Area Development District, Lexington, Ky.

PRIVATE

Georgetown Concerned Citizens, Georgetown, Ky.
Irvin Industrial Development, Inc., Lexington, Ky.
Kentucky American Water Company, Lexington, Ky.
Consultants to Local Agencies
Private Citizens

PROJECT DESCRIPTION

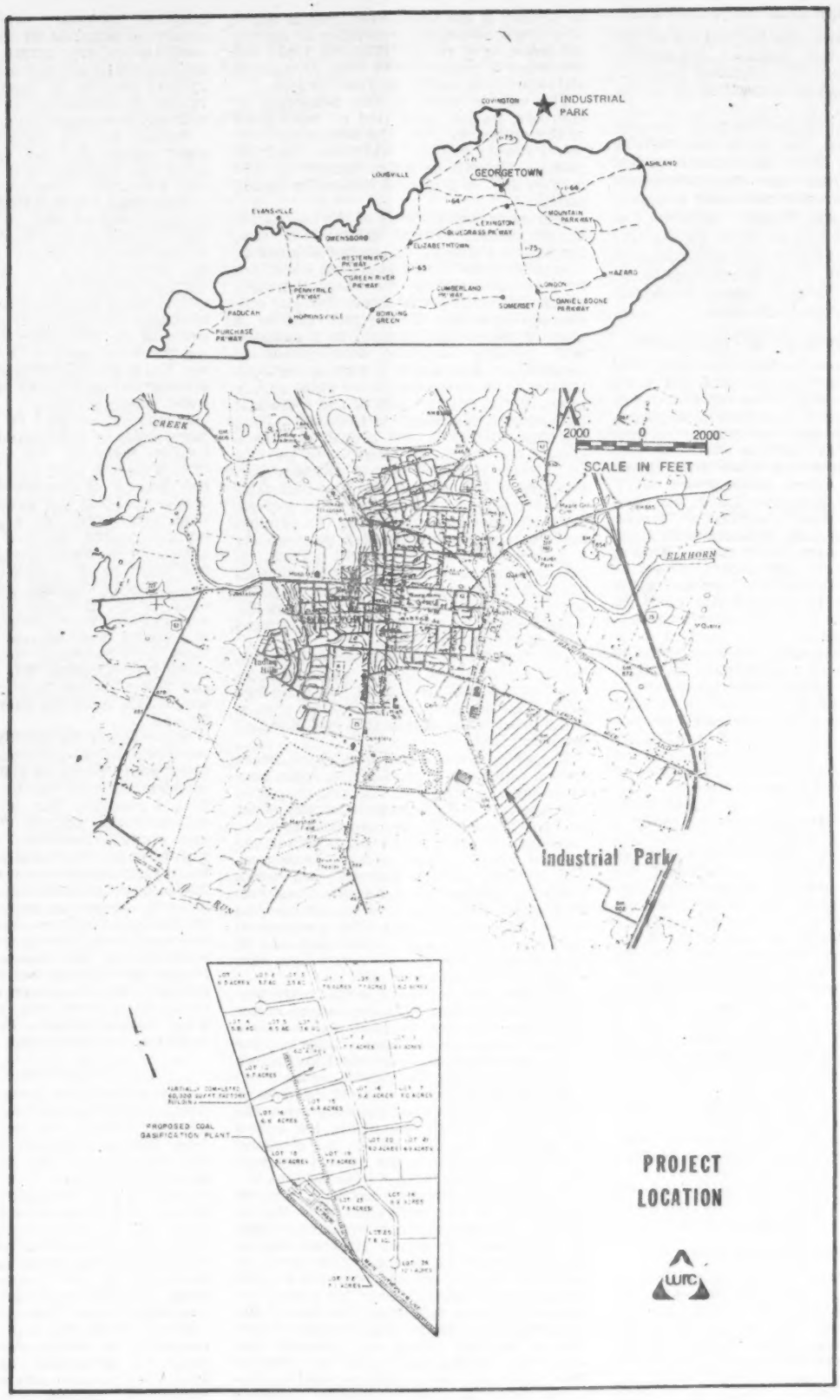
The proposed demonstration project will be located in the city of Georgetown in Scott County, Ky. The site lies within an industrial park in the southeast corner of the city adjacent to rail facilities of the Southern Railway Co. The industrial park is being developed by the Irvin Industrial Development Co., who will design and construct the demonstration project. The U.S. Department of Energy and the Commonwealth of Kentucky will share in the costs of project development and operation.

The project will produce low Btu fuel gas useable for manufacturing processes and space heating for future developments in the industrial park. Under full operation the project will convert annually 26,280 tons of coal to gas. The project will contain two gasifier units, and facilities for handling coal, purifying the gas product and controlling waste residuals.

The city of Georgetown has given conditional approval to the project.

WATER UTILIZATION IN THE PROJECT

Water will be used in the gasification process itself, and for removal of waste heat, for purification of the gas product and for sanitary purposes. The Department of Energy has estimated that under full operation the project will require 72,000 gallons per day of water supply; 18,000 gallons per day will be consumptively used within the gasification process and for evaporative cooling. The volume of wastewater to be disposed of has been estimated to be 54,000 gallons per day.


INDUSTRIAL PARK
COVINGTON
GEORGETOWN
LOUISVILLE
ASHLAND
EVANSVILLE
OWENSBORO
LEXINGTON
BLUEGRASS PKWAY
MOUNTAIN PARKWAY
ELIZABETHTOWN
WESTERN KY PKWAY
GREEN RIVER PKWAY
HAZARD
PENNYRILE PKWAY
CUMBERLAND PKWAY
LONDON
SOMERSET
DANIEL BOONE PARKWAY
PADUCAH
HOPKINSVILLE
BOWLING GREEN
PURCHASE PKWAY
CREEK
2000 0 2000
SCALE IN FEET
ELKHORN
Industrial Park
PROPOSED COAL GASIFICATION PLANT
PROJECT LOCATION
WTC

STATUS OF PLANNING IN THE PROJECT AREA

A comprehensive plan for land use and development has been prepared and adopted for Scott County. The proposed project is located within an area specified as an "industrial district."

The water supply system of the city of Georgetown has been assessed recently (1977). The assessment makes recommendations for improvements; however, a plan has not been adopted.

A plan for wastewater facilities has been prepared and adopted by the city of Georgetown under the provisions of section 201 of the Amendments of 1972 to the Federal Water Pollution Control Act (Pub. L. 92-500).

WATER RESOURCES IN THE PROJECT AREA

The project area lies within the Kentucky River Basin. The Kentucky river is a major tributary of the Ohio River and drains over 7,000 square miles in east-central Kentucky.

Surface water resources in the immediate area of the project include North Elkhorn Creek and a tributary, Cave Run Creek. North Elkhorn Creek, which drains northwesterly to the Kentucky River, has been developed with small reservoirs at Georgetown which form part of Georgetown's municipal water system. The creek has little or no flow during dry periods and cannot be considered as a dependable source of water supply beyond the current use made by Georgetown. The flow of Cave Run Creek is even less dependable.

The principal ground water resources in the project area are characterized by underlying limestone within which underground solution channels and caverns have developed. Collapse of overburden into these caverns and the formation of sink holes at the ground surface is common throughout the area, including the industrial park. Springs are also common in the area.

Royal Spring, located in Georgetown, serves as the principal source of water supply for the city. Minimum flow of the spring during severe dry periods is estimated to exceed 0.5 million gallons per day (mgd); flows as great as 55 mgd have been measured. Royal Spring is connected to Cave Run Creek through underground solution channels which connect to the creek several miles south of Georgetown. Hence a major portion of the creek's watershed, which extends southeasterly into the city of Lexington, forms part of the spring's recharge area. Areas of the North Elkhorn Creek watershed and areas of the industrial park also may recharge the spring through sink holes and underground solution channels.

Water supplies are imported to Scott County through facilities of the Kentucky American Water Co. The source of these supplies is the Kentucky River, at Pool No. 9 of the river's navigation system.

The quality of all of the above resources are suitable for municipal and industrial purposes following standard treatment.

MUNICIPAL WATER SUPPLY FACILITIES

The water system of the city of Georgetown is primarily supplied by Royal Spring; the small reservoirs on North Elkhorn Creek supplement the supply from the spring. The estimated safe yield of the combined systems is about 1 mgd. Present (1975) demands on the system exceed 1.4 mgd, including unaccounted for water use of about 30 percent of the total. Water supply shortages would accompany repetition of historical droughts of record (1930 and 1953); the frequency of recurrence of these droughts is estimated to be once in 50 years, or less.

The city is aware of the possibility of shortage, having completed an assessment of the system in 1977. The assessment proposed development of additional reservoir storage. Growth in water demand to 3.34 mgd by 1997 is projected within the assessment.

The water requirements of the coal gasification project (72,000 gallons per day) amount to 5 percent of present demand at Georgetown; by itself the project would not be a major factor in the water shortages which will occur under severe drought conditions. However, the project implies a much more serious problem in association with pending economic development at Georgetown, such as the industrial park. Estimates in other studies of the water supply needs of full development of the industrial park range from 400,000 to 1,000,000 gallons per day. Therefore, the project manifests prompt and continuing attention by the city to the existing water supply problem, particularly if the project and the industrial park are served by the city water system. This attention should include (1) development of a water conservation program for implementation during drought periods, (2) management of industrial water demands through the city's zoning and building permit powers, (3) control of losses from the water supply system, and (4) development of an additional source(s).

The facilities of the Kentucky American Water Co. include a 12-inch water main located about 2,000 feet from the industrial park. The company has indicated that it could provide continuous (but not standby) water service to the park.

The water main is part of a much larger system which serves most of the urban area of Lexington, Ky. The primary source of water for the system is the Kentucky River at Pool No. 9 with supplemental supplies available from reservoirs built to supply the original system of the city of Lexington. The present system includes two water treatment plants with a combined capacity of 40 mgd. Present water demands on the system are near 30 mgd. The company is currently increasing the supply capacity of its Kentucky River diversion by 7 mgd, with completion scheduled by 1981.

The Kentucky River is a complex hydrologic system developed by major and minor reservoirs. The river is maintained for commercial navigation in lower reaches and for recreational craft in upper reaches through a system of locks and navigable pools.

Recent studies by both the State of Kentucky and the Corps of Engineers indicate that during drought conditions the inflow to the river pool from which the company withdraws is less than the present demand. The corps studies further indicate that the present demand could be met with minimal drawdown of the navigation pool during drought conditions such as occurred in 1953 (probability of recurrence of about once in 50 years). However, during recurrence of an extreme drought, such as occurred in 1930 (recurrence of about once in 100 years), the pool level would fall below the top of the intake structure of the water system, recreational boating would be impeded, and other uses of the pool would be affected. The risk of such an event is minimal and believed tolerable under currently accepted practice. However, projected future increases in demands on the water system, in combination with future increases in withdrawals upstream, will increase the frequency and severity of these drawdowns and reduce the tolerability of such events below standard acceptance levels.

Among current efforts to resolve the water supply problem, the Corps of Engineers was directed by the Congress to conduct a study of future water supply needs of communities which would have been served by the proposed Red River Lake. Activity which would lead to implementation of the Red River Lake project has been terminated. The current study has progressed through preparation of a draft report which (1) reaffirms the potential for water supply shortages for municipal and industrial purposes in the Kentucky River Basin including the service area of the Kentucky American Water Co. and (2) provides evaluation of alternative means for resolution of the water supply problem.

Legislation adopted in 1966 by the Commonwealth of Kentucky provided administrative authority for allocation of the State's waters, thus modifying the common law practice of riparian water rights prevalent throughout the Eastern United States. Under this authority, a permit system has been instituted. However, a procedure for allocation of water among individual uses and users to be applied during periods of water supply shortage has yet to be developed for the Kentucky River. In the case of a serious shortage, the powers of the Commonwealth could be used in which case it is likely that municipal water needs would be given high priority. The Kentucky American Water Co. has been issued a permit for withdrawal from the Kentucky River up to 38 mgd.

Water service by the Kentucky American Water Co. to the industrial park at Georgetown would result in a modest increase in withdrawals from the Kentucky River (less than 4 percent). The requirements of the demonstration project (72,000 gallons per day) would be less than 1 percent of present withdrawals. The immediate impact of this increased demand on the water supply problem in the Kentucky River would be insignificant. However, considered in the broader context of additional economic growth and increased water use in the river basin and service area of the company, the demonstration project exemplifies the need for local interests and the Commonwealth of Kentucky to proceed with resolution of the water supply problem, in cooperation with involved Federal agencies.

WASTEWATER DISPOSAL

Wastewater from the coal gasification facilities will originate from within the process, from facilities for removal of impurities from the gas product and from cooling tower discharges. This wastewater will receive pretreatment prior to proposed discharge to the Georgetown sanitary sewer system. The design criteria for the pretreatment will be selected to meet conditions which will be required by the Department for Natural Resources and Environmental Protection of the Commonwealth of Kentucky. Sanitary wastes are also proposed for discharge to the Georgetown sewer system.

Runoff from the coal storage facility is proposed for conveyance to a retention pond for settlement of solid materials. Water in the pond may be used within the project for makeup water for the cooling

system if adequate in quality; otherwise, it is proposed for discharge to the Georgetown sewer system. Runoff from impermeable surfaces (e.g., parking lots) is proposed for collection to storm sewers draining to North Elkhorn Creek, upstream of the reservoirs which form the supplemental source of water supply for Georgetown. This water will contain substances typical of drainage from roads, parking lots, and roofs; barring introduction of materials from the gasification facilities, the drainage should not degrade the creek in view of the extensive volume of similar drainage throughout the watershed.

Wastewater which would result from failures in the design, operation, or maintenance of the facility would likely follow natural drainage patterns to either North Elkhorn Creek, Cave Run Creek, or sinkholes, possibly connected to Royal Spring.

The present Georgetown municipal sewage treatment plant is a modern facility with rated capacity of 2 mgd. Current volumes of wastewater treated average 1.1 mgd; therefore the plant has present surplus capacity to receive the wastewater to be disposed of by the demonstration project. However, full development of the industrial park and other developments in Georgetown could increase wastewater volumes above the treatment plant capacity. The adopted facilities plan for the Georgetown wastewater system projects wastewater volumes of 2 mgd in 1996; this estimate is based on lower volumes of industrial wastewaters than reflected in the range of estimated water use in the industrial park. A need for early review and updating of the facilities plan by the city is apparent considering the possible impact of development of the industrial park.

Discharge of wastewaters from the gasification project to the system would require approval by the city to assure conformance with ordinances controlling industrial wastewater discharges.

Conclusions and Other Findings

1. Industrial development of the project site is generally consistent with the land use plan prepared by the Scott County-Georgetown Planning Commission. Further, the city of Georgetown has given conditional approval to development of the project.

2. The water requirements of the project, estimated by the Department of Energy, could be met by either of the municipal water supply systems of the city of Georgetown and the Kentucky American Water Co. The impact of service to the project upon either water system or source of supply will be minimal. However, Georgetown is subject to a shortage of water supplies under drought conditions of moderate severity (or worse). The problem of shortages will become severe if the industrial park is served by the city's system and is fully developed, or if other development occurs in the service area of the water supply system.

3. Several steps to alleviate the water supply problem at Georgetown are evident. First, the community needs to arrive at firm decisions regarding development of an additional source and the means and timing for implementation. Concurrently, a plan should be formed and adopted for reduction in water demand and distribution of available supplies during periods of shortage; also, efforts should be undertaken promptly to minimize system leakages and other losses. The city has authority to control industrial water use by restricting future development to light industry.

4. A water supply problem also exists in the Kentucky River which is the source for the Kentucky American Water Co. Under severe drought conditions, municipal water demands cannot be met without reduction of navigation pool levels well below operational objectives. A comprehensive plan for water supply management encompassing water conservation and other measures is needed in the basin for adoption and implementation by local interests and the Commonwealth of Kentucky, with Federal participation where appropriate.

5. Wastewater produced by the demonstration project can be accepted by the sanitary sewer system of the city of Gerogetown after pretreatment. Sufficient surplus capacity is available at the city's sewage treatment plant for this purpose. The extent of surplus capacity may diminish rapidly as a result of development of the industrial park and other areas served by the city's sewer system. The existing facilities plan for the municipal sewer system should be updated accordingly with implementation of the resulting recommended measures.

6. Royal Spring, the primary source of water supply for Georgetown, is subject to degradation in water quality by the introduction of wastewaters from various sources in Georgetown, developed areas of Scott and Fayette Counties, and possibly the city of Lexington. Success in permanently preserving the quality of the spring will be difficult to achieve given the apparent extent of the recharge area and present and probable future land use development. Nevertheless, first steps can be taken by Georgetown through control of land use and requirements regarding construction practices, drainage facility design and maintenance, storage and disposal of wastewater, and design of facilities involving hazardous materials. Several such steps are implicity in the proposed design of the demonstration project. Additional steps involving (1) covering the coal storage pile, (2) conveyance of surface runoff which comes in contact with the gasification facilities or adjacent areas to a retention pond and then the sanitary sewer system, and (3) provision of a dike around the gasification facility to control leakage of hazardous materials which might result from design or operational failures, would add to the environmental safety of the project. Initiatives of this type taken by the city of Georgetown generally throughout the recharge area of the spring within the city's limits might lead to complimentary efforts by Scott and Fayette Counties, and the Commonwealth of Kentucky in remaining recharge areas.

7. The importance of the spring also merits improved understanding of its geohydrology. This includes development of a reliable continuous data base of the spring's outflow and additional data on the extent of recharge from individual sources. Also, more extensive water quality data would aid in reaching conclusions on the extent of increased (or decreased) degradation which is occurring, and in the protection of the spring from potential new sources of degradation.

List of Selected References

1. "Coal Gasification Demonstration Project, Georgetown, Kentucky," G. Reynolds Watkins Consulting Engineers, Inc., Lexington, Ky., May 1978.

2. "Draft Environmental Impact Statement: Low Btu Coal Gasification Facility and Industrial Park, Georgetown, Kentucky," U.S. Department of Energy, Washington, D.C., April 1978.

3. "Environmental Report on the Kentucky—Federal Energy Park in Georgetown, Kentucky," Dames & Moore, Inc., Lexington, Ky., September 1977.

4. "Draft Special Report: Water Supply Alternatives to Red River Lake," Louisville District, U.S. Army Corps of Engineers, January 1978.

5. "Preliminary Draft: Metro-Lexington Urban Study," Louisville District, U.S. Army Corps of Engineers, April 1978.

6. "Georgetown, Kentucky, 201 Facilities Plan, 1976-1996," Proctor-Davis-Ray Consulting Engineers, Lexington, Ky., June 1977.

7. "Water Study for Georgetown, Kentucky," Proctor-Davis-Ray Consulting Engineers, Lexington, Ky., August 1977.

8. "Georgetown-Scott County Physical Development Plan," Scruggs & Hammond, Inc., Lexington, Ky., June 1974.

9. "Hydrogeology of the Georgetown Area," John Thrailkill and Joseph Troester, University of Kentucky, Lexington, Ky., January 1978 (unpublished).

[FR Doc. 78-18879 Filed 7-7-78; 8:45 am]

The authentic text behind the news . . .

The Weekly Compilation of PRESIDENTIAL DOCUMENTS

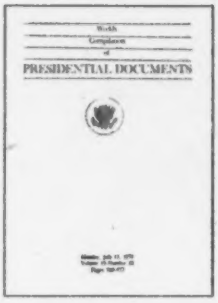
Administration of Jimmy Carter

This unique service provides up-to-date information on Presidential policies and announcements. It contains the full text of the President's public speeches, statements, messages to Congress, news conferences, personnel appointments and nominations, and other Presidential materials released by the White House.

The Weekly Compilation carries a Monday dateline and covers materials released during the preceding week. Each issue contains an Index of Contents and a Cumulative Index to Prior Issues.

Separate indexes are published quarterly, semiannually, and annually. Other features include lists of acts approved by the President and of nominations submitted to the Senate, a checklist of White House press releases, and a digest of other Presidential activities and White House announcements.

Published by Office of the Federal Register, National Archives and Records Service, General Services Administration



SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION FOR 1 YEAR TO: WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS (PD)

@ $15.00 Domestic; @ $23.50 Foreign.
@ $15.00 additional if Domestic first-class mailing is desired.

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402